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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/552,529	10/11/2005	Jae Hyun Lee	LEE-0036	6682
23413 7590 04/13/2009 CANTOR COLBURN, LLP 20 Church Street 22nd Floor Hartford, CT 06103				
EXAMINER ARCTERO, ADAM A				
ART UNIT		PAPER NUMBER		
1795				
NOTIFICATION DATE		DELIVERY MODE		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/552,529

Applicant(s)

LEE ET AL.

Examiner

ADAM A. ARCIERO

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 January 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SG/US)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

**CATHODE ACTIVE MATERIAL COMPRISING ADDITIVE FOR IMPROVING
OVERDISCHARGE-PERFORMANCE AND LITHIUM SECONDARY BATTERY
USING THE SAME**

Examiner: Adam Arciero S.N. 10/552,529 Art Unit: 1795 April 7, 2009

DETAILED ACTION

1. The Applicant's amendment filed on January 15, 2009 was received. Claims 1-6 and 8-10 are currently amended.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Objections

3. The claim objections for claims 4 and 10 are withdrawn, because Applicant has amended the claims.

Claim Rejections - 35 USC § 112

4. The claim rejections under 35 U.S.C. 112, second paragraph, on claims 4 and 10 are withdrawn, because Applicant has amended the claims.
5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.
6. Claims 1-10 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not

described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In claims 1-3, 5-6 and 8-9, Applicant claims “wherein the lithium manganese oxide has a higher irreversible capacity than the lithium-transition metal oxide”. The Applicant states in the specification that the lithium manganese oxide has a large irreversible capacity, with no relation to that of the lithium transition metal oxide (pg. 2, [0025] and pg. 4, [0060]). The specification does not provide any basis for a battery having cathode active material comprising a lithium manganese oxide and a lithium transition metal oxide, wherein the lithium manganese oxide has a higher irreversible capacity than that of the lithium transition metal oxide.

Claim Rejections - 35 USC § 103

7. The claim rejections under 35 U.S.C. 103(a) as unpatentable over MANABU et al. on claims 1-2, 4-8 and 10 are withdrawn, because applicant has amended the claims.
8. The claim rejections under 35 U.S.C. 103(a) as unpatentable over MANABU et al. and HASEGAWA et al. on claims 3 and 9 are withdrawn, because applicant has amended the claims.
9. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over MANABU et al. (JP 2002-100357 A) in view of HASEGAWA et al. (US 5,609,975 A).

As to Claims 1, 3-4 and 9, MANABU et al. discloses a lithium secondary battery comprising a positive active material layer wherein said active material layer comprises a lithium-transition metal oxide of Li_xCoO_2 wherein $0.9 \leq x \leq 1.1$, capable of lithium ion

intercalation/deintercalation. Said active material also comprises a lithium manganese oxide represented by $\text{Li}_x\text{Ni}_y\text{Mn}_{1-y-z}\text{M}_z\text{O}_2$ with $0.9 \leq x \leq 1.2$; $0.4 \leq y \leq 0.6$ and $0 \leq z \leq 0.2$; which is in the form of a R-3-m rhombohedron structure (layered structure) and wherein M can be Cr (paragraph [0009]) and “z” can be zero. MANABU et al. does not expressly disclose wherein the lithium manganese oxide is represented by $\text{LiM}_x\text{Mn}_{1-x}\text{O}_2$ where $0.05 \leq x \leq 0.5$ and M is at least Cr, Al, Mn and Co and wherein said lithium manganese oxide has a higher irreversible capacity than the lithium-transition metal oxide.

However, HASEGAWA et al. teaches of a positive active material having a layered structure represented by $\text{Li}_x\text{A}_{1-y}\text{M}_y\text{O}_2$ where A can be Mn and M can be Cr and $0.05 \leq x \leq 1.1$ and $0 \leq y \leq 0.5$ (Abstract and col. 1, lines 24-25). These ranges encompass the claimed values for Li, Cr and Mn (Abstract). The courts have held that in the case where the claimed ranges “overlap or lie inside ranges disclosed by the prior art” a *prima facie* case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). Furthermore, the courts have held that because both the prior art of HASEGAWA et al. and MANABU et al. teach an active material for use in a lithium secondary battery,, it would have been *prima facie* obvious to substitute one active material for the other. Express suggestion to substitute one equivalent for another need not be present to render such substitution obvious. See KSR, MPEP, 2141 III. MANABU et al. and HASEGAWA et al. teach a cathode active material having a mixture of a lithium-transition metal oxide with a lithium manganese oxide. However, the prior art references do not specifically disclose wherein the lithium manganese oxide has a higher irreversible capacity than the lithium-transition metal oxide.

As to Claim 2, MANABU et al. teaches a lithium manganese oxide having a layered structure as discussed above, wherein said structure has a content of 20-70% by weight (paragraph [0013]). This

range overlaps the claimed range. The courts have held that in the case where the claimed ranges “overlap or lie inside ranges disclosed by the prior art” a *prima facie* case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990).

As to Claim 5, MANABU et al. discloses a lithium secondary battery having an anode ([0026]), a cathode ([0008]), a separator ([0023]), a nonaqueous electrolyte comprising an electrolyte compound ([0022]) and a salt ([0023]), and the cathode active material as discussed above in claim 1.

As to Claim 6, MANABU et al. teaches the formula 1 starting material, however MANABU et al. does not expressly disclose wherein the lithium manganese oxide having a layered structure changes to a spinel structure after the first charge/discharge. However, it is the position of the Examiner that such properties are inherent, given that both MANABU et al. and the present application utilize the same cathode active material with the same lithium manganese oxide as an additive. A reference which is silent about a claimed invention’s features is inherently anticipatory if the missing feature is *necessarily present in that which is described in the reference*, *In re Robertson*, 49 USPQ2d 1949 (1999).

As to Claim 7, MANABU et al. teaches a nonaqueous electrolyte employing a lithium salt such as LiPF_6 ([0023]).

As to Claim 8, MANABU et al. teaches a lithium manganese oxide having a layered structure as discussed above, wherein said structure has a content of 20-70% by weight (paragraph [0013]). This range overlaps the claimed range. The courts have held that in the case where the claimed ranges “overlap or lie inside ranges disclosed by the prior art” a *prima facie* case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990).

As to Claim 10, MANABU et al. teaches the lithium transition metal oxide as being Li_xCoO_2 where $0.9 \leq x \leq 1.1$ ([0009]) which encompasses the claimed value of 1. The courts have held that in the

case where the claimed ranges “overlap or lie inside ranges disclosed by the prior art” a *prima facie* case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990).

Response to Arguments

10. Applicant's arguments filed on January 15, 2009 have been fully considered but they are not persuasive.

Applicant's principal arguments are:

a) *MANABU et al. fails to disclose the lithium manganese oxide of amended claim 1 (claim 1).*

b) *HASEGAWA et al. does not disclose or suggest the combination of a lithium manganese oxide and a lithium transition metal oxide (claim 1).*

In response to Applicant's arguments, please consider the following comments.

a) HASEGAWA et al. teaches of the claimed lithium manganese oxide having a layered structure of the present invention and one of ordinary skill in the art would find it obvious to substitute one known element for another.

b) MANABU et al. teaches a combination of both a lithium manganese oxide and a lithium transition metal oxide. HASEGAWA et al. teaches the claimed lithium manganese oxide, and it would be obvious to substitute one known element for another (HASEGAWA's lithium manganese oxide for MANABU's lithium manganese oxide).

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ADAM A. ARCIERO whose telephone number is (571)270-5116. The examiner can normally be reached on Monday to Friday 8am to 5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on 571-272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AA

/PATRICK RYAN/
Supervisory Patent Examiner, Art Unit 1795